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COMPARISON OF MULTIPLE INSTRUMENTS MEASURING VASCULAR SYSTEM CHANGES IN PREDICTING LEFT VENTRICLE HYPERTROPHY: THE BOGALUSA HEART STUDY

ACC Moderated Poster Contributions
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Background: The effect of impaired arterial compliance on cardiac structure changes has been broadly described. However, information is limited as to which of the available non-invasive measurements of arterial compliance better indicates changes in the cardiac structure (as defined by hypertrophy of the left ventricle), in relatively young asymptomatic adults.

Methods: In a community- based biracial (black-white) cohort of 895 participants (36.6% male, 27.6% blacks) aged 29-50 years (mean of 43.3), vascular compliance measurements were assessed in terms of: Peripheral Augmentation Index @75bpm - pAI@75, Large Artery Elasticity Index -C1, Small Artery Elasticity-C2, Systemic Vascular Resistance - SVR, Peterson´s Elastic Modulus - Ep, Young´s Elastic Modulus - YEM, and aorto-femoral Pulse Wave Velocity (afPWV). Left Ventricle Hypertrophy (LVH), with a prevalence of 19.3% (n=176) in our population, was defined through echocardiographic evaluation and estimation of the Left Ventricular Mass Index indexed to height (LMVI2.7), considering an inclusion criteria of LVMI>51 g/m2.7

Results: As expected, the group with LVH had decreased C1, C2 and increased SVR, Ep, YEM, pAI@75 and afPWV . In multiple regression analyses, creating one model for each non-invasive vascular parameter with adjustments for age, ethnicity, gender and traditional CV risk factors, pAI@75 showed a significantly greater predictability for LVH, (OR=1.44 (1.41-1.95) p=0.001) in contrast to the other non- invasive predictors.

Conclusions: In this study of asymptomatic adults, peripheral Augmentation Index, a resultant of the analysis of the pulse wave, demonstrated greater association with LVH, compared to other non-invasive vascular measurements based on elasticity indices. This observation suggests that the analysis of the pulse wave through the arterial tree serves as an earliest predictor for changes in the cardiac structure. Further, this observation helps to enhance the assessment of CV risk as evaluated with the clinical Framingham and Reynolds scores.